RMIT UNIVERSITY

TAYLOR'S COLLEGE

Wisdom · Integrity · Excellence

MATH2111 Class Exercise 7

Family Name	Other Names	Student No.

CALCULATORS MUST NOT BE USED

1. Consider the compound proposition $(P \wedge Q) \vee R \Rightarrow \neg P \vee R$.

   (a) Construct the truth table for the compound proposition.

(4)

   (b) Is the compound proposition a tautology, a contradiction or a contingency? Give a reason for your answer.

(2)

2. Suppose that the predicate $P(x)$ means "x is a prime number".

   (a) Let the domain of interpretation be $D_1 = \{1, 2, 3, 4, 5\}$. Which of the following statements are true?

   (i) $P(3)$

   (ii) $P(4)$

   (iii) $\exists x\, P(x)$

   (iv) $\forall x\, P(x)$

(2)

   (b) Find a 3-element set D_2 of positive integers such that $\exists x\, P(x)$ is false.

(1)

   (c) Find a 4-element set D_3 of positive integers such that $\forall x\, P(x)$ is true.

(1)